



United States  
Department of  
Agriculture

Forest  
Service

December 2002



# **SUMMARY**

## **Draft Environmental Impact Statement**

### **Metolius Basin Forest Management Project**

Sisters Ranger District, Deschutes National Forest  
Jefferson County, Oregon

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**METOLIUS BASIN FOREST MANAGEMENT PROJECT**  
**Draft Environmental Impact Statement**  
**Jefferson County, Oregon**

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**Abstract:** The USDA Forest Service is proposing to implement fuel reduction and forest health management activities in order to meet the goals of reducing the risk of catastrophic wildfire, insect or disease events in the project area; protecting people, property and tribal and natural resource values; restoring old-growth forests, and protecting water and soil quality. Proposed actions include thinning dense forest stands, burning surface fuels, mowing dense shrubs, and closing roads, on approximately 12,600 acres of National Forest lands. Approximately 1.6 miles of temporary roads may be developed to aid in the access to and removal of trees. An additional action would be a site-specific amendment of visual quality standards and guidelines in the Deschutes National Forest Land and Resource Management Plan to allow short-term visibility of thinning and burning activities.

This project is located in the Metolius Basin on the Sisters Ranger District in Central Oregon. The entire project area is within a Late-Successional Reserve and encompasses a portion of the Metolius Basin Wild and Scenic River.

Five alternatives were fully analyzed to gain an understanding of potential impacts of different strategies for meeting project goals. Alternative 4, with an emphasis on balancing landscape-scale risk reduction with providing late-successional habitat, is the preferred Alternative. However, the Forest Supervisor would like to consider some elements from Alternative 3 in certain areas, and elements from Alternative 5 in certain areas (i.e. larch restoration). As such, readers are encouraged to review all of the Alternatives, and comment on elements of the other alternatives that the Forest Service should consider in the final decision.

**Review and Comment:** Reviewers should provide the Forest Service with their comments during the review period of the draft environmental impact statement. This will enable the Forest Service to analyze and respond to the comments at one time and to use information acquired in the preparation of the final environmental impact statement, thus avoiding undue delay in the decision-making process. Reviewers should structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewers' position and contentions. Environmental objections that could have been raised at the draft stage

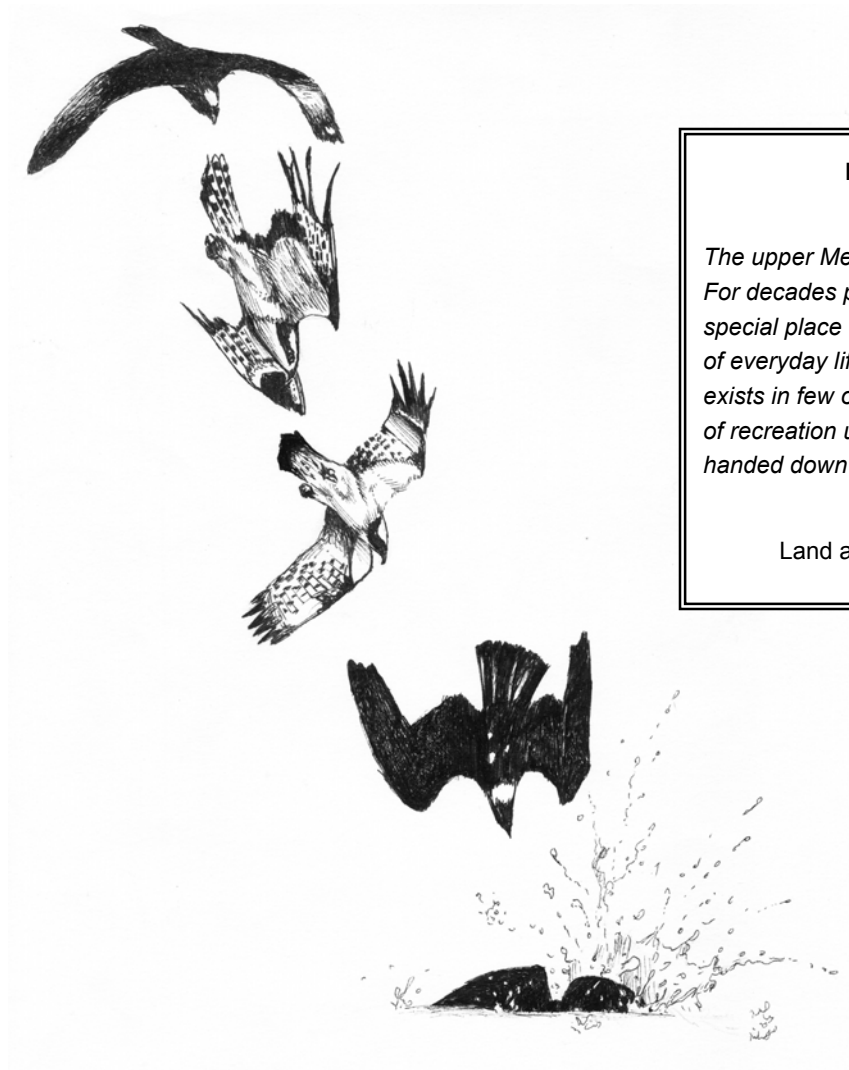
may be waived if not raised until after completion of the final environmental impact statement. Comments on the draft environmental impact statement should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (40 CFR 1503.3).

**Send Comments to:**

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**Date Comments Must be Received:**

**February 15, 2003**



**Metolius Conservation Area**

*The upper Metolius Basin is an inspiring forest setting. For decades people have found the Metolius to be a special place where they are relieved from the stresses of everyday life amidst a unique natural beauty that exists in few other places. In many families, a tradition of recreation use and love of the Metolius has been handed down over several generations.*

Land and Resource Management Plan, pg. 4-164

## TABLE OF CONTENTS

<b>Purpose &amp; Need for Action .....</b>	<b>2</b>
<i>Why reduce the risk of wildfire across the landscape, and not just around homes? .....</i>	<i>2</i>
<i>Declining Forest Health .....</i>	<i>2</i>
<i>Concern about Roads.....</i>	<i>3</i>
<b>Proposed Action .....</b>	<b>5</b>
<b>Decision to be Made .....</b>	<b>6</b>
<b>Public Involvement .....</b>	<b>6</b>
<b>Desired Future Condition.....</b>	<b>7</b>
<i>What does a healthy forest look like? .....</i>	<i>7</i>
<b>Issues .....</b>	<b>10</b>
<b>Alternatives.....</b>	<b>10</b>
<i>Description of Possible Techniques and Strategies.....</i>	<i>11</i>
<i>Alternatives Considered in Detail.....</i>	<i>17</i>
<i>Mitigation.....</i>	<i>25</i>
<i>Alternatives Considered but Eliminated from Detailed Study.....</i>	<i>25</i>
<b>Environmental Consequences.....</b>	<b>26</b>
<i>Major conclusions: .....</i>	<i>26</i>
<i>Summary of Effects .....</i>	<i>27</i>
<b>Forest Plan Amendments .....</b>	<b>36</b>
<i>Visual Quality .....</i>	<i>36</i>
<i>Fuelwood Collection.....</i>	<i>36</i>

## Purpose & Need for Action

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The local community of Camp Sherman, which has been watching the declining health of their surrounding forest lands, approached the Forest Service with concerns about the safety of their community to wildfire, and the safety of the surrounding natural resources, including the clean, clear waters of the Metolius Wild and Scenic River, and the beautiful old-growth ponderosa pine forests. The community's concerns were heightened after the severe ice storms of 1999/2000 in the Camp Sherman area damaged thousands of trees. Residents became afraid of losing something they treasured.

In response to these concerns, the Sisters Ranger District initiated the Metolius Basin Forest Management Project (see Figure 1 for project location). This project will not only address community concerns, but help continue implementation of the long-term strategic fuel reduction and forest health plan across the District. The District plan has involved vegetation and fuel management both at the landscape-scale and in focused, strategic zones (i.e. cross-District fuel breaks and defensible space around communities). Improving forest health and reducing the risk of catastrophic loss from wildfire, insects or disease is well supported by direction in the Deschutes National Forest Land and Resource Management Plan and recommendations from the Metolius Late-Successional Reserve Assessment and Watershed Assessment.

It is important to continue the landscape fuel management strategy so that forest resources and adjacent communities are protected. During the last 10 years, there have been 14 large wildfires on the Sisters Ranger District, each burning with greater speed and intensity. Because of extreme fire behavior, these fires have been difficult to control; homes have been lost; late-successional habitat has been lost, lives have been threatened.

### **Why reduce the risk of wildfire across the landscape, and not just around homes?**

Reducing fuels within the wildland urban interface can help reduce the rate of spread and increase the ability to control low to moderate intensity wildfire within these corridors. Reducing fuels at a larger landscape scale reduces the risk of high intensity crown or spotting fires moving through or over wildland urban interface fuel reduction areas. Also, there are many other important forest values (i.e. late-successional habitat, water quality, soil productivity, and scenic beauty) that can be protected outside of the wildland urban interface. "The Metolius Basin is truly unique in the quality and diversity of its natural resources and spiritual values" (Metolius Conservation Area goals, Deschutes National Forest Land and Resource Management Plan, pg. 4-164). We cannot afford to ignore this potential risk, and must act now to protect these values.

### **Declining Forest Health**

Ponderosa pine forests in the East Cascades, including within the project area, are dry, fire-adapted ecosystems. These forests historically burned every 8-12 years. However, 80 years of fire exclusion means that 7-10 fire cycles have been missed, allowing decades of vegetation to accumulate.

Forest health in these over-dense stands is declining, resulting in an increasing risk of losing late-successional habitat to wildfire, insects or disease. In addition, due to the extensive accumulation of fuels, there is a higher risk of losing the well-established old-growth ponderosa pine, which are resilient to low-intensity fires but can be lost in high-intensity burns, and which are considered a highlight of the basin.

*Under normal conditions of forest and rangeland health, fires play a vital role in removing excess fuels and maintaining normal plant composition and density. These fires tend to burn at ground levels, generating low temperatures and moving relatively slowly. When burning through forested areas, these fires remove underbrush and dead growth while healthy, mature trees survive. Without active management of forests and rangelands, large, expensive and damaging wildfires will occur more frequently, causing greater damage to people, property and ecosystems. Intelligent, active land management that minimizes the risk of severe fires is needed to protect forest and rangeland ecosystems.*

Healthy Forest Initiative, pg 4

### Concern about Roads

Another concern about impacts to the health of the Metolius Basin forest and streams are the high density of Forest System and user-created roads. Roads that cross or are adjacent to rivers can be an avenue for sediment delivery into streams and contribute to cumulative watershed impacts. Reducing the miles of open roads could help mitigate potential resource effects that may occur from proposed vegetation and fuel treatments, and can help move toward the Land and Resource Management Plan guidelines on road density.



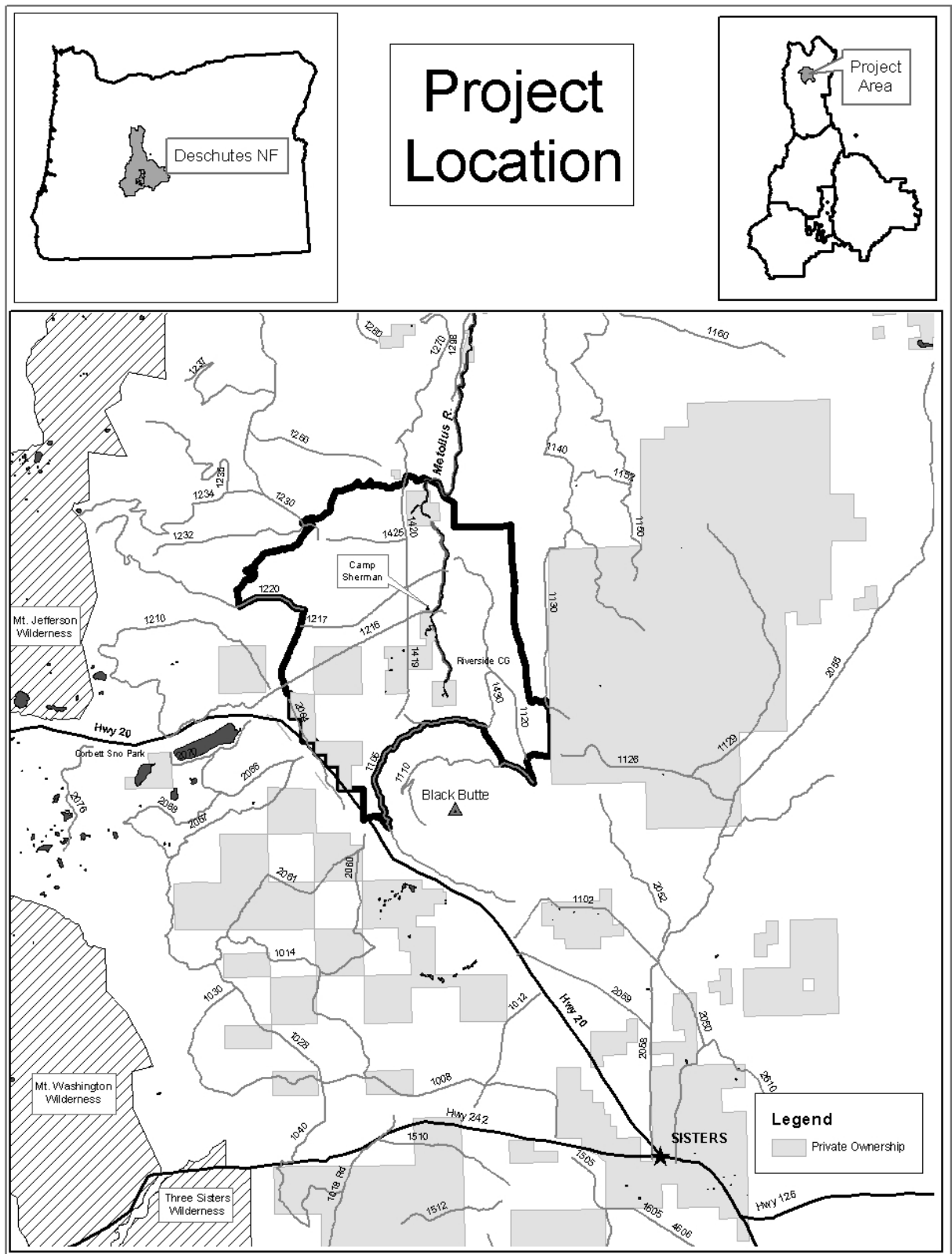


Figure 1. Project Location.



## Proposed Action

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**What:** The Forest Service proposes to address the purpose and need by meeting 4 goals:

1. Reduce the risk of catastrophic wildfire, insect and disease
2. Protect safety of people, property, tribal and natural resources
3. Restore late-successional (old-growth) forest conditions
4. Protect and restore watershed conditions

Actions proposed to reduce the risk of catastrophic wildfire and protect people, property and resources would include thinning trees, mowing small vegetation, and prescribed burning to reduce the amount and arrangement of fuel. Actions to restore forest health and protect watershed conditions include thinning trees to reduce stand densities and reduce stress on current and future late-successional forests; restoring the rare but important features of aspen stands, larch stands, and meadows in order to restore habitat diversity; and reduce miles of open road to help mitigate effects from vegetation and fuel treatments, move toward Land and Resource Management Plan guidelines for road density, and protect forest resources (water, soil, late-successional habitat, spread of noxious weeds).

**Why:** Approximately 82% of forest stands on National Forest lands in the project area are at stand densities higher than can be sustained over the long-term, and approximately 97% of the project area is at risk of moderate to high severity wildfire. People, property, late-successional habitat and forest resources are at risk.



Typical density in many stands in the project area

**When:** Project implementation would begin in the summer of 2003. The plan would be implemented as quickly as possible, depending on funding, but could take 5 or more years.

**Where:** Broad-scale forest health and risk reduction actions would be implemented on approximately 12,100 acres across the project area (Figure 2-2, Chapter 2), including focused fuel reduction treatments within the defensible space corridors adjacent to residential and high public use areas, and along evacuation route roads.

**How:** The project would be implemented through a combination of traditional service contracts, timber sale contracts, stewardship contracts and partnerships. The Metolius Basin Forest Management Project is a pilot under the Stewardship Pilot Authority that allows new contracting methods to implement the project, working more closely with the community and forest industry.

The proposed action responds to the goals and objectives outlined in the Deschutes National Forest Land and Resource Management Plan (LRMP) as amended by the Northwest Forest Plan

and Wild and Scenic River Plan. It helps move the project area towards desired conditions described in those plans and associated watershed and Late-Successional Reserve assessments. The proposed action is also consistent with direction from the President's Healthy Forest Initiative, the National Fire Plan, and Oregon's 11-point plan.

## Decision to be Made

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Based upon the effects of the alternatives, the responsible official will decide:

- Should proposed vegetation and fuel management actions be implemented in the Metolius Basin Forest Management Project Area to reduce risk of high severity wildfire and improve forest health?
- If so, then what areas are to receive vegetation and fuel treatments, when are they to be treated, and what methods will be used?
- What roads should remain open within the project area to meet resource needs and public uses?
- Should a site-specific amendment to the Deschutes National Forest Land and Resource Management Plan be made to allow some actions that may not meet visual quality standards and guidelines in the short-term?
- Should a site-specific amendment to the Deschutes National Forest Land and Resource Management Plan be made to allow fuelwood collection in the Metolius Heritage area as a tool for implementing the project?

## Public Involvement

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The Notice of Intent (NOI) to initiate this Environmental Impact Statement was published in the Federal Register on January 17, 2002, and requested public comments on the proposal. In addition, as part of the public involvement process, the agency held numerous meetings in the local community, a meeting with the Confederated Tribes of Warm Springs; consulted with the US Fish and Wildlife, National Marine Fisheries Service, and Oregon State Historic Preservation Office; worked closely with a federally appointed advisory committee representing a wide range of local interests, conducted five field trips for the public and several for specific interest groups, and met and conversed with numerous individuals regarding the project. All people concerned about the project were invited to visit the site with members of the planning team (though not many of these people chose to come visit). Information about the project was also provided for the public through letters and newsletters from the Sisters District, a website dedicated to the project, and through numerous articles in the local newspaper.

In addition, the Sisters Ranger District coordinated with a local conservation organization, Friends of Metolius, to plan, design and implement a small-scale demonstration project in the Metolius Basin to demonstrate forest management techniques that may be used in the larger project area. The objective of this project was to provide an educational opportunity easily

accessible to visitors and residents. The Friends of Metolius conducted weekly field tours for the public of the demonstration area throughout the summer.

## Desired Future Condition

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### What does a healthy forest look like?

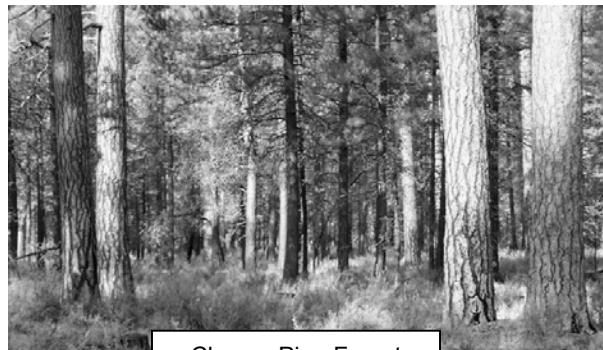
The Metolius Basin Forest Management project area, within a designated Late Successional Reserve under the Northwest Forest Plan, provides important habitat for a range of late-successional species. The project was designed to address the needs of the primary, or “focal” late-successional species, by dividing the project area into habitat zones, depending on environmental factors such as moisture, soil productivity, and elevation (Figure 2). Each zone has different forest conditions that can best support the desired habitat.

1. Open Pine Forest – open stands of mature ponderosa pine with scattered younger trees, typically 1 or sometimes 2 canopy layers, low brush heights and densities, and low stand densities. Provides late-successional habitat for White-headed Woodpecker and Peck's penstemon.



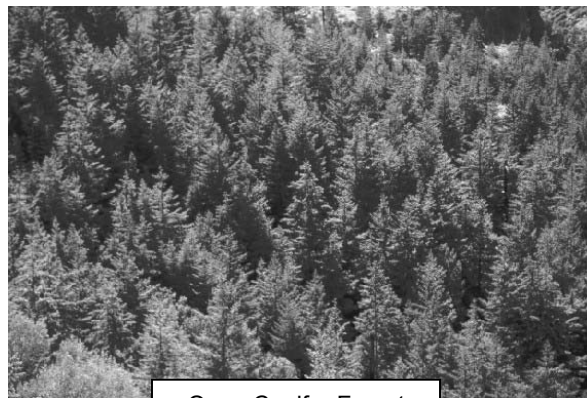
Open Pine Forest

2. Clumpy Pine Forests - Mosaic pine forests, with open stands and denser pine thickets, 1 or 2 canopy layers. Provides late-successional habitat for Goshawk.

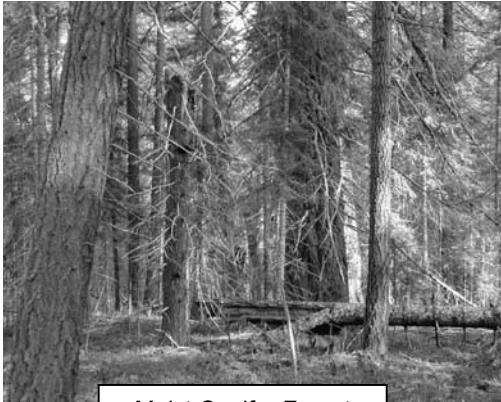


Clumpy Pine Forest

3. Open Conifer Forests - Mixed stands of pine and fir, higher densities, generally 2 or more canopy layers. Provides late-successional habitat for dispersal of spotted owl.



Open Conifer Forest



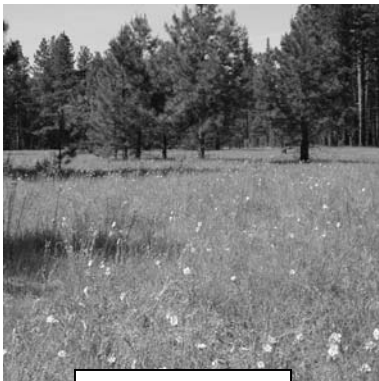
Moist Conifer Forest

4. Moist Conifer Forests – multiple canopy layers, overall high stand densities, a diversity of tree species and sizes. Provides late-successional habitat for spotted owl, and other species associated with dense forests.

5. Riparian areas – Shady, riparian forests, with high vegetative and structural diversity, and more dead wood. Provides habitat for bull trout and other riparian dependent species.

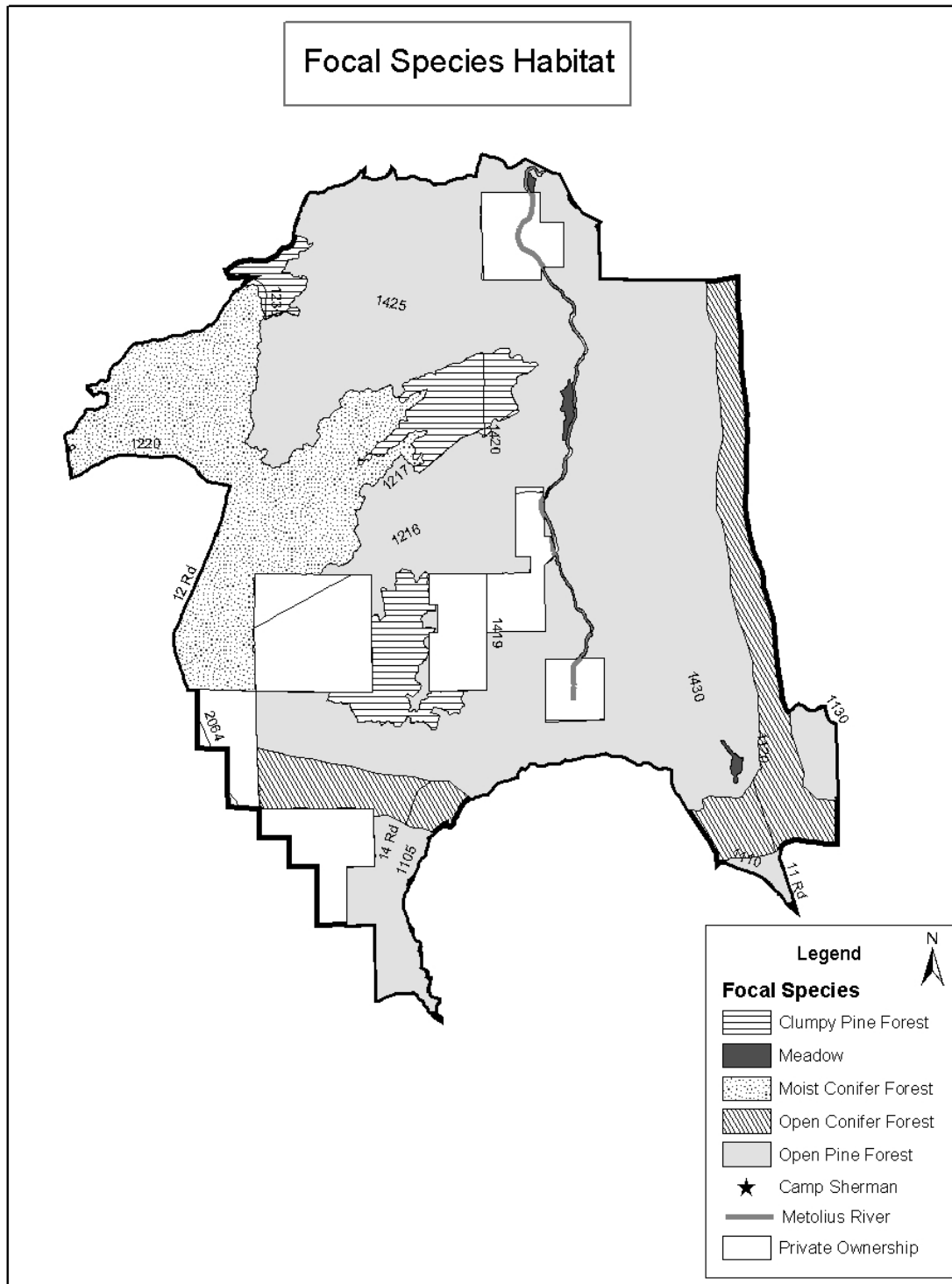


Riparian Habitat



Meadow Habitat

6. Meadows – Open with a few scattered large trees. Provides diversity, edge and foraging habitat for many late-successional species.



**Figure 2. Focal Species Habitat – Desired Future Condition.**

## Issues

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The major issues that arose during public scoping of the proposed action relate to concerns about:

**1. Management of Vegetation in Late-Successional Reserves**

*Though the use of vegetation management in a Late-Successional Reserves is authorized under the Northwest Forest Plan, there is debate about the type and amount of management that should be done.*

**2. Size of Trees Removed**

*What is the socially acceptable diameter limit of trees that can be cut and removed to meet project objectives, and what is the ecologically optimal range of tree size and structure to leave in forest stands to meet the needs of late-successional species?*

**3. Fire/Fuels Management**

*Prescribed fire can be an effective tool for reducing fuel levels and risk of high intensity wildfires. Will residents and visitors to the Metolius Basin accept short-term impacts from fire, such as smoke and blackened trees, produced by controlled burning to meet project objectives?*

**4. Water Quality and Soil Health**

*Tree harvest to reduce fuel levels and improve forest health can have impacts on soil and water. What are the best ways to mitigate these impacts?*

**5. Road Access**

*Reducing miles of roads can help reduce resource impacts and mitigate effects from vegetation management, particularly sedimentation in the river system, but also reduces public access to certain sites in the project area. What is the best network of roads to maintain for public use, while protecting forest resources?*

## Alternatives

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This section describes the alternatives considered for the Metolius Basin Forest Management Project. It includes a description and map of each alternative considered. Also, a description of possible techniques (either silvicultural, fuel management, or road management) are described.

## Description of Possible Techniques and Strategies

The range of possible vegetation, fuel and road management actions was developed to help meet forest health<sup>1</sup> and risk reduction goals, and to address the habitat goals for late-successional species within the project area. These actions are based on effectiveness research of management actions, and management experience applying different techniques.

### *Defensible Space Strategy*

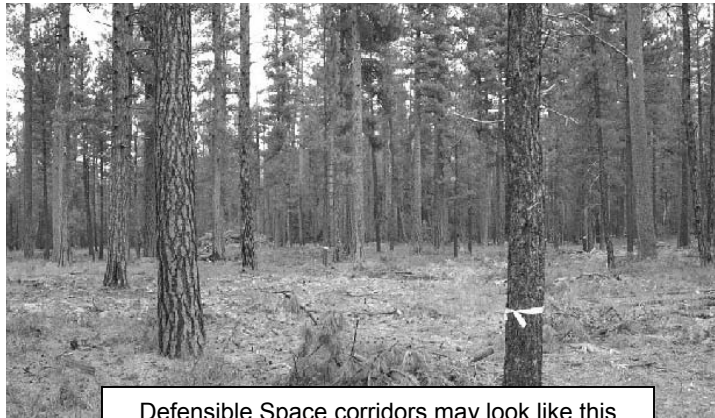
Under each of the Action Alternatives (2-5), there will be a contiguous (though still with variety in tree size, species and spacing) corridor of reduced fuels approximately 600' on either side of the main routes into the Basin (Forest Roads 12, 14, 1419, 1420, 1120, 1216), and approximately 1200' on either side of the residential areas and other areas of high use (campgrounds, resorts) (Figure 3).

Actions in the defensible space would primarily be thinning from below, focusing on leaving long-lived, fire resistant ponderosa pine, larch and Douglas-fir. These activities would be combined with mowing and underburning as needed, hand piling and some pruning-up of limbs. Where thinning would occur as part of a broader landscape-scale treatment, the largest trees that would be removed would depend on the Alternative scenario (see Alternative Description). Where healthy stand conditions or sensitive resources would not need or benefit from thinning, then trees 8" diameter or less would be removed within the Defensible Space corridor to assure continuity of reduced ground fuels adjacent to roads and homes. The defensible space would look more open, with shorter brush heights and fewer small trees. Most of the large trees would remain.

#### **Reducing Risk of Wildfire at 3 Levels**

Wildfire risk would be managed with 3 different, though interrelated strategies:

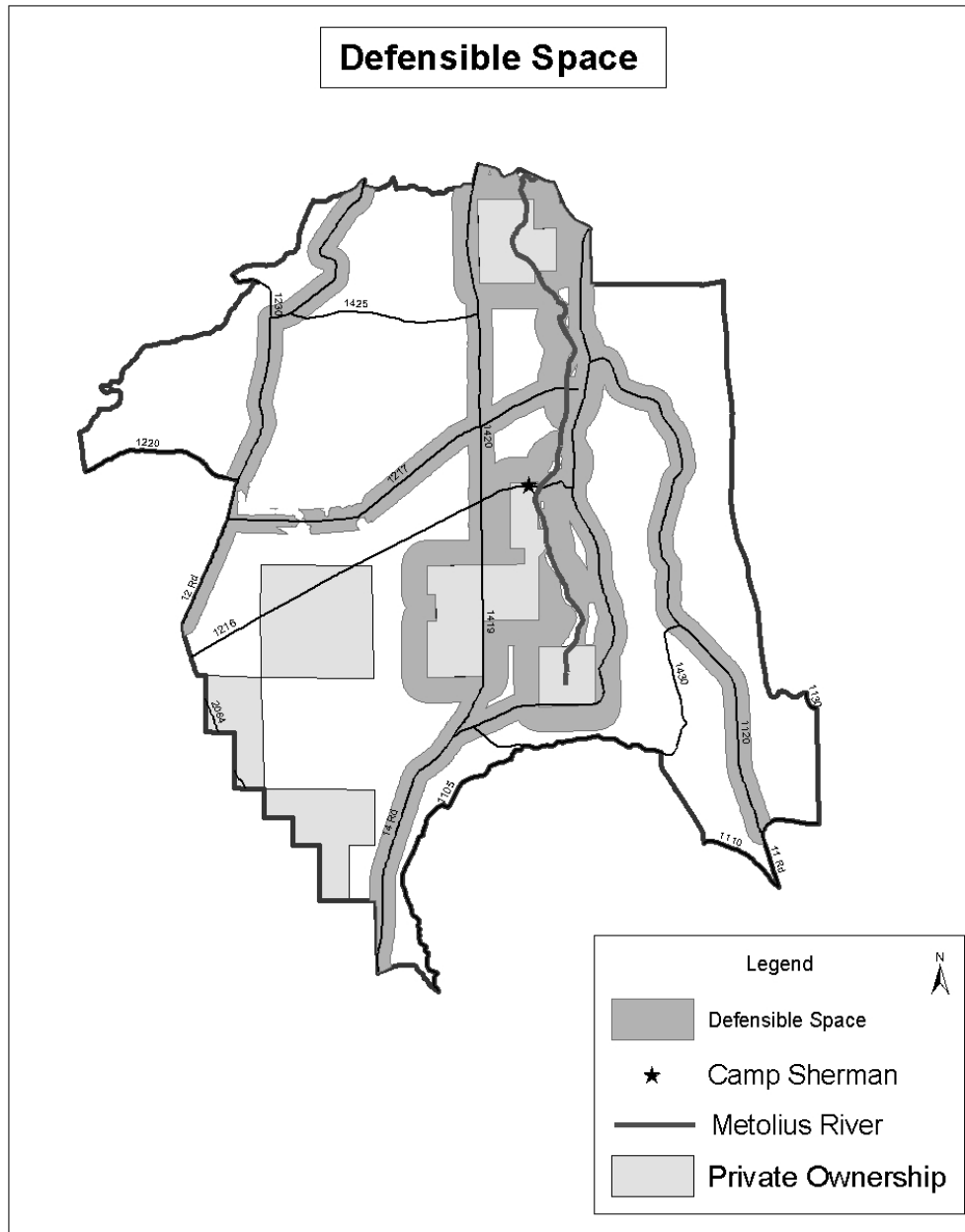
1. Landscape Level – Risk of high severity wildfire would be reduced across the project area through broad-scale thinning, burning and mowing.
2. Defensible Space in the Wildland/Urban Interface – Focused fuel reduction zones adjacent to residential and high use areas, and along evacuation route roads.
3. Around Homes – the responsibility of homeowners to manage fuel on their property. (see [www.firefree.org](http://www.firefree.org) for tips on creating safety zones around your home).



Defensible Space corridors may look like this stand

<sup>1</sup> *Forest Health* is defined as the “condition in which forest ecosystems sustain their complexity, diversity, resiliency, and productivity to provide for specified human needs and values” (pg. 2-60, ICBEMP Draft EIS, 2000). Ecosystem health refers to the “condition where the parts and functions of an ecosystem are sustained over time and where the system’s capacity for self-repair is maintained, such that the goals for uses, values, and services of the ecosystem are met” (pg. 1-2, ICBEMP Draft EIS, 2000).

The defensible space corridors would be areas where fire intensity is reduced so that firefighters can more safely make a stand to suppress wildfire that is moving toward main travel routes or high use areas. The corridor of reduced fuel, in combination with landscape-level treatments, would provide a better chance for fires to stay low to the ground, and burn at a lower intensity. These are the types of fires that can be most successfully suppressed, tend to do the least damage to forest resources, and can be beneficial to a fire-adapted ecosystem like the Metolius Basin.



**Figure 3. Location of Defensible Space Zones.**



### ***Silvicultural Prescriptions***

**No Silvicultural Treatment:** Forest stands that are functioning well and not at high risk of severe wildfire, insects or disease; or stands that may be at risk but are currently providing important habitat for focal late-successional species, would not be treated at this time. (See *Metolius Heritage Demonstration Units 9-11 – “control” units*)

**Aspen Restoration:** Removal of most of the small and mid-sized conifers, and regeneration of aspen by hand or mechanical cutting. The objective is to improve growing conditions for a few declining stands of aspen, so this rare habitat is maintained in the project area for diversity.

**Meadow Enhancement:** Restoration and maintenance of natural meadows through removing small (12” diameter or less) conifers. The objective is to reduce the number of trees growing into and closing-up the meadow openings.

**Mowing:** Mowing to reduce brush height and density in order to reduce ladder fuels. This treatment would be used primarily in conjunction with prescribed underburning, either where underburning is a primary treatment or where it would be done to reduce fuels created by tree cutting prescriptions (clean up “activity fuels”). (See *Metolius Heritage Demonstration Unit 6 (mow and burn)* and *8 (mow only)*.)

**Dwarf Mistletoe Control:** Pruning mistletoe-infected branches of lightly to moderately infected trees, to improve the health and longevity of the tree. This treatment would also involve killing (to create snags) moderately to heavily infected overstory trees when these trees are infecting young trees in the understory, preventing stand development. Stands with dwarf mistletoe would also be thinned to reduce competition stress within the stand. (See *Metolius Heritage Demonstration Unit 1a*)

**Thinning trees up to 12 inches diameter:** Removal of trees 12 inches diameter or less through thinning from below<sup>2</sup>, either in existing “plantations” (stands that have been replanted after harvest) or in stands that have not received regeneration harvest but have high densities of small trees. Early seral species (i.e. ponderosa pine and larch) would be retained. The objective is to reduce competition and improve the health and vigor of remaining trees, and reduce fire hazard. The trees cut would be mostly saplings ( $\leq 5$  in. diameter). (See *Metolius Heritage Demonstration Unit 3 and 5*).

#### ***What Will the Forest Look Like?***

Many of these management techniques have been applied on a small-scale in the Metolius Heritage Demonstration project area, located near Camp Sherman at the corner of Forest Roads 1419 and 1216. Techniques proposed for this project that were used in the Demonstration project are identified, along with the plot in which it was used. This allows people to see what the forest may look like after the technique is applied. In addition, more photographs and descriptions of vegetation management techniques can be found on the website for this project at:

<http://www.fs.fed.us/r6/centraloregon/index-metolius>

<sup>2</sup> Thinning “from below” entails removal of trees, beginning with the smallest and moving toward larger trees, until the desired/prescribed basal area (density) is met for the stand. If the desired density can be met by removing only smaller trees, then mid-sized and larger trees would not need to be removed.

## Basal Area

A healthy forest grows with the inputs of sunlight, water and nutrients. If forests do not get the right mix or amount of these inputs (due to limited availability from competition or external factors), then the forest may not grow well, or in some cases, may not grow at all (stands will stagnate). The Sisters Ranger District wants to create conditions for a healthy forest; one that can provide late-successional habitat, and can be resilient to disturbances. The proposed vegetation and fuel management actions are expected to help reduce the intensity and severity of disturbances, and help grow a healthy, resilient forest.

*Basal area* is the surface area of the cross-section of a tree at 4.5' from the ground. When the basal area of trees in a stand are added together, it tells us about tree density. Basal area is one measure of the amount of tree biomass. If basal area is very high for a particular area in the forest (too much biomass – too much competition), then the forest would not grow as well, remain as healthy, or be as resilient to disturbance.

Science can tell us what type of forest conditions will develop under high or low basal areas. People's values tell us what forest conditions are desired. For example, In certain areas it may be desirable to manage forests at high basal areas (higher than optimal for growth or resiliency to wildfire, insects or disease), such as where we need to maintain dense forest conditions for rare old-growth species, or where people want dense forests to provide screening. However, these choices involve tradeoffs. If we choose to maintain high basal areas, the forest stand may be at higher risk to catastrophic disturbances, and there is a greater risk of losing much of the forest features that we wanted to save. If we choose to maintain forest stands at lower basal areas, we would not be providing habitat for species that need dense forest conditions (though these conditions were not historically very common in the Metolius Basin ponderosa pine forests) and we would lose some effect of vegetative screening. However, this lower basal area would result in a forest condition that is more resilient to catastrophic disturbance, and therefore, likely to be sustained for a longer period than the dense forests, and can provide late-successional habitat for species that prefer open, mature stands.

An important goal of this project is to reduce stand densities, so that we can have more resilient, healthy forests.

Thinning trees up to larger diameters: This treatment would involve *thinning from below* potentially up to the diameter limit for the Alternative, which varies (see the description of Alternatives 3, 4 and 5). The objectives are to reduce stand densities and to modify fuel amounts and arrangements. The desired density would be approximately 80-140 square feet basal area, depending on site productivity and stand structure objectives (see insert on “basal area”). The healthiest and largest trees would remain, and a focus would be on retaining healthy ponderosa pine, western larch, white pine, and Douglas-fir. This treatment could benefit habitat conditions for late-successional species that are associated with open, mature stands.

Prescribed Underburning:

Underburning in stands with a fire-resistant overstory. Underburning may be a stand-alone treatment or may be combined with incidental removal of smaller (8-inch diameter or less) trees and mowing as needed to reduce concentrations of fuel and help prepare a resilient stand when burning is later applied. (See



*Metolius Heritage Demonstration*

*Units 1a, 1b, 2a, 2b, 4, 5, 6 and 7. Unit 4 is a burn only unit, and unit 6 would combine mowing and burning. On each of the other units underburning would be a follow-up treatment after tree removal).*

Shelterwood: This treatment would only be considered under Alternative 5. The objective of this treatment would be to regenerate or re-grow healthy trees in stands that are in poor condition due to past spruce budworm activity, root diseases, or dwarf mistletoe. These stands are generally mixed-conifer with white fir as the dominant species (approximately less than 25% of the stand would be made up of ponderosa pine, Douglas-fir or larch). The primary species removed would be white fir. All ponderosa pine (free of dwarf mistletoe) 21 inches diameter or greater and additional healthy trees (where present) would be left to achieve a residual spacing of approximately 40 to 75 feet (average of 7-25 trees per acre), with a basal area of approximately 20 to 50 square feet per acre.

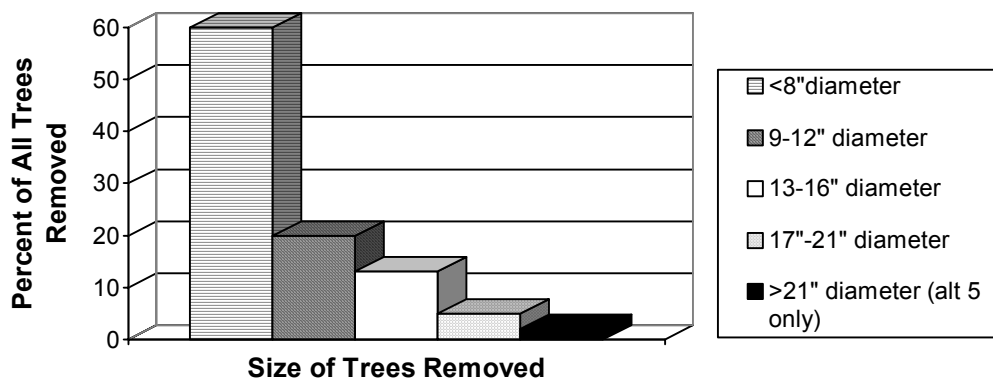
Thinning trees up to larger diameters in conjunction with Shelterwood Harvest: The objective of this treatment would be to thin from below the healthy portions of stands described under Shelterwood above, and to retain green trees in a stand where they exist, while still creating conditions favorable for re-growth of long-lived, fire-resistant seral species (ponderosa pine and western larch). These portions of the stands would generally have greater than 25% healthy ponderosa pine, Douglas-fir or larch.

Larch Restoration: This treatment would only be considered under Alternative 5. The objective of this treatment would be to restore or re-grow declining larch stands, which provide important habitat and visual diversity in the predominately pine forest. Trees would be thinned in conjunction with group openings (removing the majority of trees except for healthy larch) from  $\frac{1}{4}$  to 3 acres in patches of western larch. This prescription would be applied to larch stands that are moderately to heavily infected with larch dwarf mistletoe. There is widespread decline of larch due to mistletoe and competition from pine, white fir, and Douglas-fir. As many healthy larch as possible would be retained by pruning off the mistletoe infected branches. Removal of the most heavily infected trees would prevent further spread of mistletoe and would open up the stand creating conditions favorable for establishment and growth of natural regeneration and planted larch. The resulting stand would appear much more open than a thinned stand. (See *Metolius Heritage Demonstration Unit 1a*).

### **What Size of Trees would be Removed?**

Each of the Action Alternatives proposes a different upper limit on the size of trees that could be removed from the forest, because this was expressed as an important issue from the public. However, since all thinning would remove the smallest trees first (“thinning from below”), and since the majority of the trees on the landscape are under 8 to 12” diameter, then the majority of trees that would be removed would be less than 12” diameter, under any of the Alternatives.

**Predicted Percents of Different Tree Sizes that may be Removed**



The graph displays a general concept for the landscape. The actual percent of trees of different sizes removed from each stand would vary depending on stand conditions and the number of trees of different sizes within the stand.

### **Fuel Prescriptions**

*Many of the fuel treatments described below would be used in combination with other fuel and silvicultural treatments*

**Hand Piling:** This treatment would involve piling slash (limbs and tree tops) by hand and would mainly be applied when thinning trees up to 8 to 12 inches in diameter. It would also be used on sensitive soils and within riparian reserves in other vegetation treatments in order to minimize soil disturbance and compaction. (*See Metolius Heritage Demonstration Unit 3*).

**Machine Piling:** Piling slash by means of small crawler tractors, small backhoes with a grapple arm, and other low ground-pressure machines would be applied on about 70 percent of *mixed-conifer* treatments where existing fuel loads are heavy and slash would be high. This treatment is predicted to affect up to 60 percent of the unit acres (i.e. if a unit is 100 acres, up to 60 acres may be affected by the machine used to pile the slash), and would only be used where machine piling on trails could not be employed (see the next fuel prescription). Machine piling would be applied primarily in stands where trees larger than 12 inches diameter are removed. Machines would not be used in riparian reserves or on sensitive soil or steep slopes (greater than 25%).

**Machine Piling on Skid Trails:** This fuel treatment involves piling slash concentrations on skid trails by machine and would be applied when thinning to 12 inches in diameter and where a harvester/forwarder system (cut-to-length) is used in 12-21” diameter thinning. This treatment is

predicted to affect up to 20 percent of the unit acres (i.e. if a unit is 100 acres, up to 20 acres may be affected by the machine used to pile the slash), and would be employed instead of machine piling wherever possible.

Underburning: Burning, under controlled conditions, most or all of the area of a treatment unit. This would be applied in about 70 percent of the ponderosa pine stands where trees thinned are greater than 12 inches diameter, and where existing fuels are lower and species composition is predominantly ponderosa pine and/or western larch. *(See Metolius Heritage Demonstration Units 1a, 1b, 2a, 2b, 4, 5, 6 and 7. Unit 4 is a burn only unit, and unit 6 would combine mowing and burning. On each of the other units underburning would be a follow-up treatment after tree removal).*

Mowing/Underburning: Same as underburning, except that mowing would be done prior to underburning to reduce flame lengths and achieve a more controlled burn. *(See Metolius Heritage Demonstration Unit 6)*

Mowing with Hand Piling or Machine Piling: Mowing to reduce brush height and density. This may be applied with other slash piling techniques to reduce wildfire risk.

### **Road Actions**

Inactivation - Blocking (either with a gate, boulders or logs) vehicles from using the road temporarily. Roads that are inactivated from public use may be needed for routine administrative or service access (i.e. for power line maintenance), or for future access for forest management, so are not completely removed from the road system through decommissioning (see next definition).

Decommission - Rehabilitation of a road segment that is not needed currently or in the foreseeable future. Depending on the condition of the road bed, there are a variety of methods that could be used to decommission a road. If vegetation is already growing into the road bed from the surrounding forest, then very little action may be needed to decommission the road. Other actions may include obliteration or subsoiling (tilling) of parts of the road bed and reseeding or replanting the openings. All decommissioned road beds would be stabilized to mitigate erosion, and road structures (culverts) would be removed.

### **Alternatives Considered in Detail**

The Forest Service developed 5 alternatives, including the No Action and Proposed Action alternatives, for reducing the risk of catastrophic wildfire, insect or disease, and improving forest health in the Metolius Basin. The alternatives were based on ideas and comments from the public, advice from the Metolius Basin Working Group of the Provincial Advisory Committee (PAC), on legal requirements we must comply with (i.e. Endangered Species Act, National Forest Management Act, etc...) and the capability of the resources.

The 4 action Alternatives propose vegetation and fuel treatments on many of the same areas, and at first glance may appear the same. In fact, Alternative 3 and 4 are very similar, with the only difference being the potential upper limit of trees removed. After considerable discussion, Alternative 3 was added, so that a full range of effects relating to tree size (a key issue) could be

analyzed. The other two action Alternatives, 2 and 5, propose much different types of treatments (though, again some of it relates to the size of trees removed) and have different results in the ability to reduce the risk of high severity wildfire and improve forest health. The Proposed Action, Alternative 4, is a mix of vegetation and fuel treatments that are expected to help make the forest more resilient to catastrophic disturbances. These actions are based on the assumptions that reducing stand densities, and moving toward lower basal areas in many stands, can be very effective in meeting project goals. See Table 1 for details on the type and acres of treatments by Alternative, and Figures 4-6 for maps of the Alternatives.

#### **Alternative 1- No Action**

Under the No Action alternative existing processes and habitat cycles in the project area would continue largely without intervention. Current management of recreation use and services, fire suppression, hazard trees, standard road maintenance and re-closure of breached roads would continue. However, no actions would be taken to reduce risk at a landscape scale, or to actively develop a defensible space around homes and roads. This alternative will be evaluated as the baseline condition.

#### **Alternative 2**

The objective of this Alternative is to reduce short-term risk while minimizing short-term watershed and resource effects that can be associated with tree harvest, and to address the key issues of limiting tree harvest in Late-Successional Reserves, and limiting the size of trees that could be removed. This Alternative would reduce surface and some ladder fuels, but is not expected to contribute much to the reduction of stand or crown densities. The defensible space strategy would be implemented, though only trees 12" diameter or less would be removed. Approximately 71 percent of the total project area (12,135 acres, including approximately 1190 acres within riparian reserves) would be treated by proposed actions, mostly through burning, mowing and small tree (12" diameter or less) thinning. Approximately 20 miles of roads would be inactivated or decommissioned.

#### **Alternatives 3 and 4. Alternative 4 is the Proposed Action.**

These Alternatives are the same, *except* for variations on the size of trees that could be removed, so are described together. Under Alternative 3, there would be an upper limit of 16" diameter trees that could be removed for ponderosa pine, Douglas-fir and western larch. The upper limit for white fir would be 21" or less. Under Alternative 4, there would be a limit on the size of trees that would be removed to 21" diameter or less for ponderosa pine, Douglas-fir and western larch. The limit for white fir would be 25" or less.

**Tree Size Limit.** *It is important to understand that an upper limit on the size of trees that could be removed does not mean that **all** trees within these size limits would be removed. It is estimated that the majority of trees that would be removed under any Alternative would be smaller than 8" diameter.*

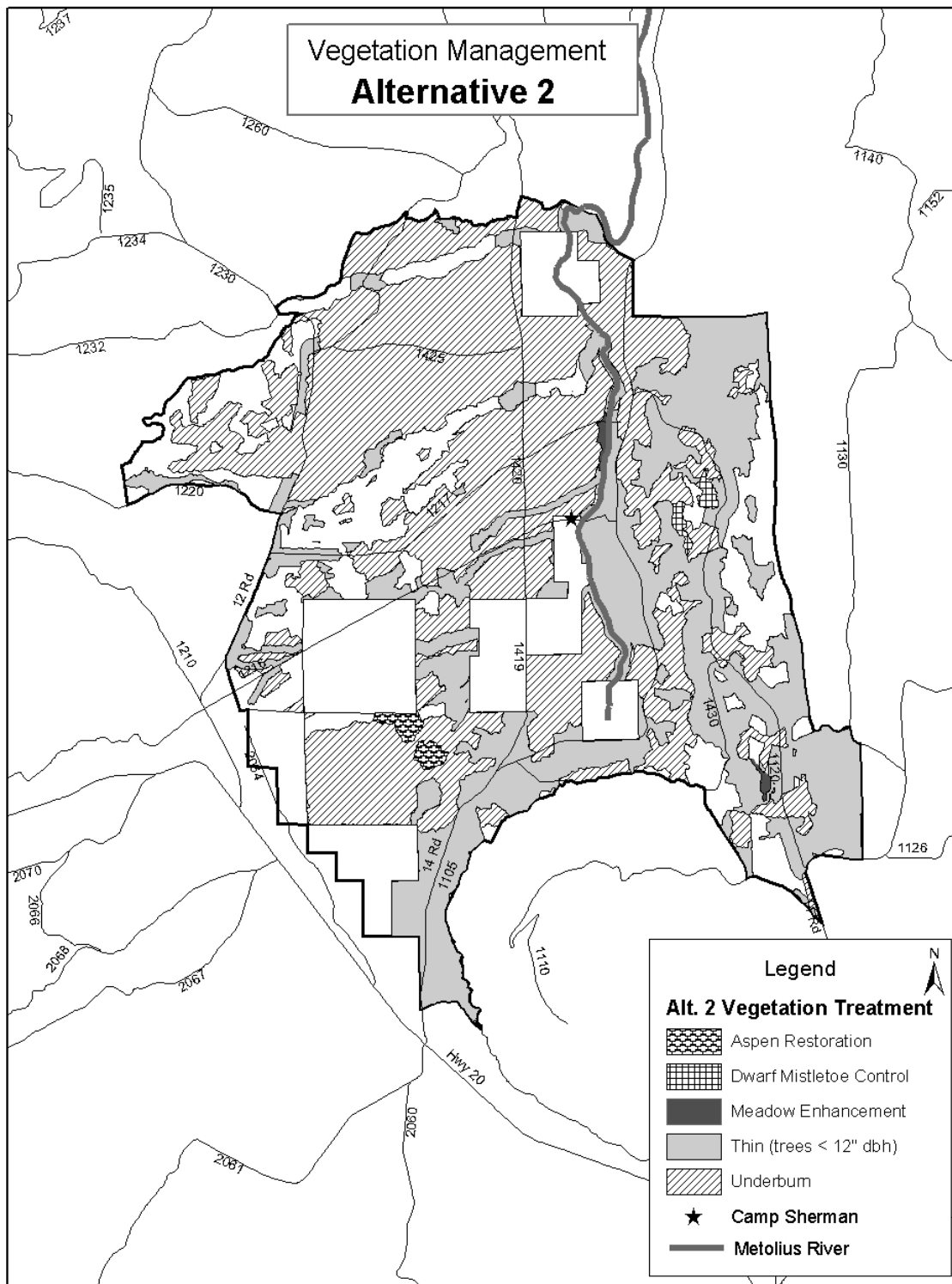
These alternatives focus on balancing risk reduction across the landscape with maintaining adequate late-successional habitat for a diversity of species. Approximately 74 percent (12,648 acres, including approximately 1190 acres within riparian reserves) of the total project area would be treated by proposed actions. The vegetation management that would

occur would primarily be thinning, combined with burning and mowing. The defensible space strategy would be fully implemented. Approximately 50 miles of roads would be inactivated or decommissioned.

#### ***Alternative 5***

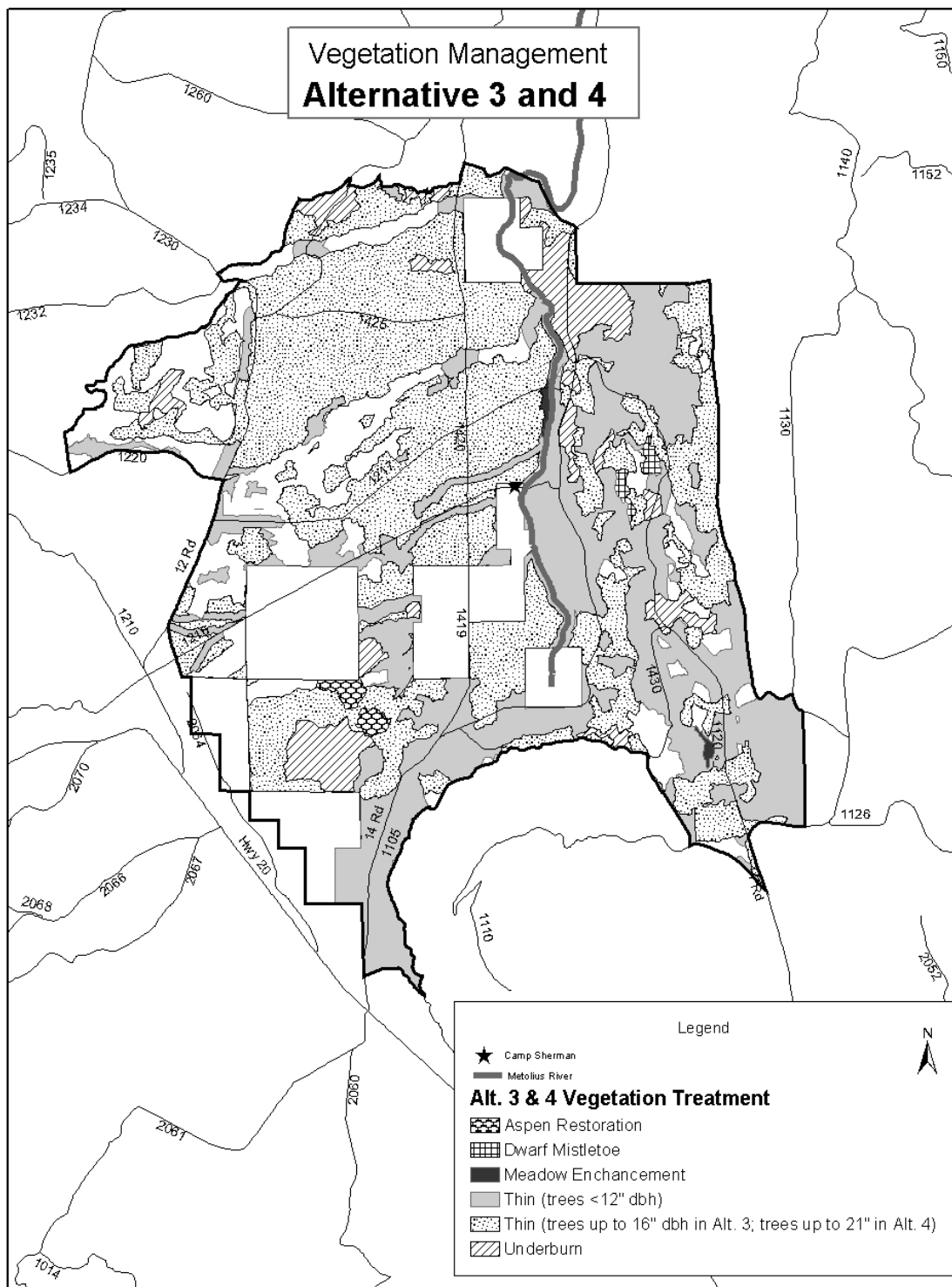
The focus of this Alternative is to maximize risk reduction across the landscape and addresses the project goals of reducing the potential losses from catastrophic wildfire, insects and diseases. The emphasis would be on providing habitat for species associated open fire-adapted stands. Approximately 75 percent (12,914 acres, including approximately 1190 acres within riparian reserves) of the total project area would be treated by proposed actions. Though there would not be a upper diameter limit specified under this Alternative, trees larger than 21” diameter would only be removed under certain conditions.

The vegetation management would again be primarily thinning, burning and mowing, but, outside of riparian reserves, there would also be some shelterwood harvest in stands with mortality and decline from bark beetle, and some small group openings to restore declining larch stands. The defensible space strategy would be fully implemented. Approximately 60 miles of roads would be inactivated or decommissioned.

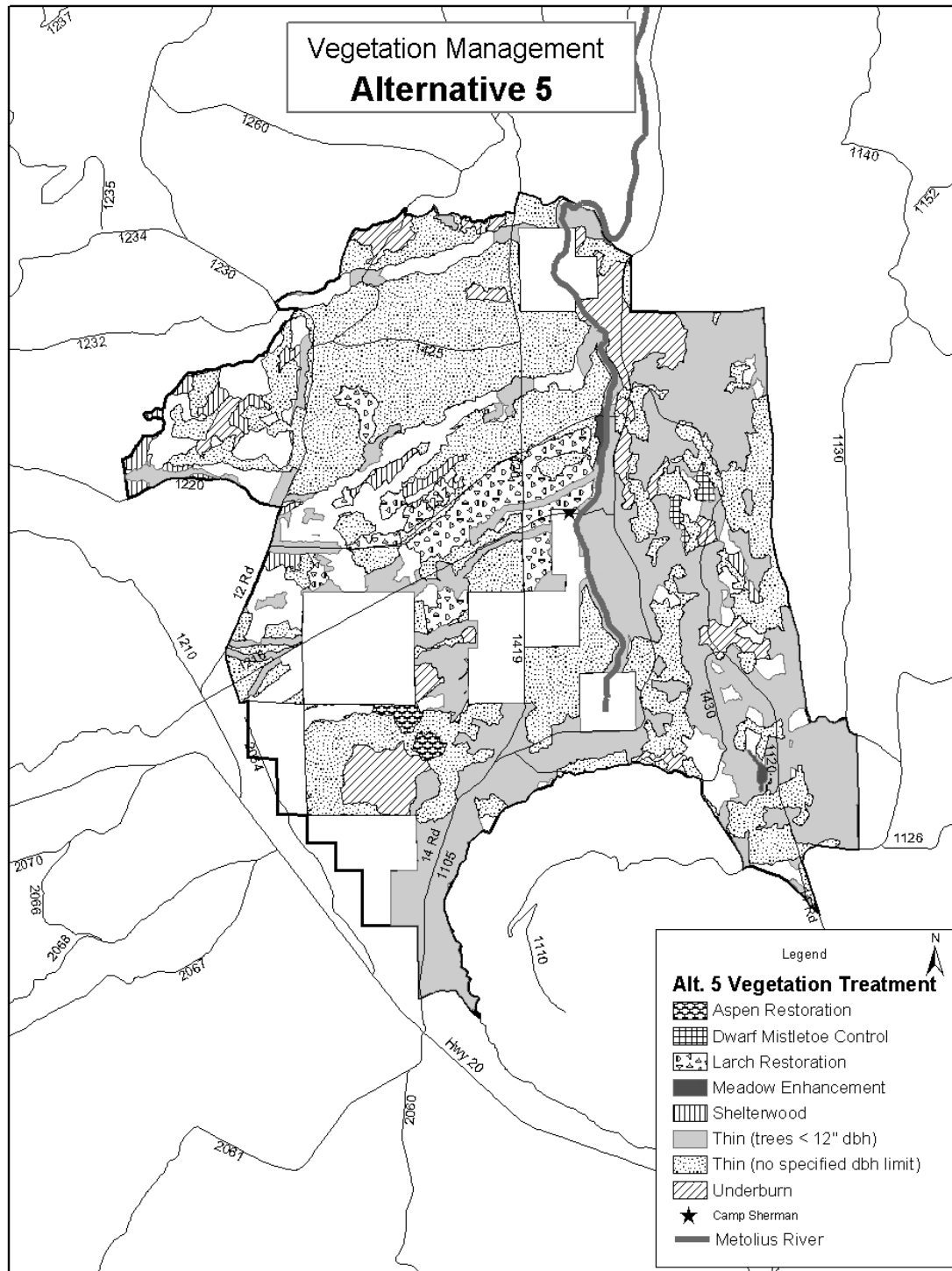


**Figure 4. Vegetation Management Treatments under Alternative 2**





**Figure 5. Vegetation Management Treatments under Alternatives 3 and 4**



**Figure 6. Vegetation Management Treatments under Alternative 5**

**Table 1. Summary of Vegetation and Fuel Treatments under the Action Alternatives.**

TREATMENTS	ALTERNATIVE 2	ALTERNATIVES 3 AND 4	ALTERNATIVE 5
Type of Vegetation Treatment	Acres of stands in which the action would occur		
<b>Thinning trees 12" diameter or less</b> - Thin stands in which removal of primarily smaller trees (12" diameter) can meet forest health and risk reduction objectives (includes 1276 acres of thinning in plantations)	4835	4638	4719
<b>Thinning up to larger diameters</b> - Thin stands in which benefits can be achieved by removing trees up to the potential tree size limit of 16" diameter under Alternative 3, 21" diameter under Alternative 4, and no specified limit under Alternative 5 (though removal of trees larger than 21" diameter would only occur under certain conditions <sup>3</sup> ). Trees under 12" diameter would also be thinned in these stands.	0	6758	5836
<b>Shelterwood</b> – Removing dead and declining trees in stands affected by root disease, dwarf mistletoe and spruce budworm. Also includes thinning healthier portions of the stands.	0	0	296 (includes 172 acres of shelterwood only, and 124 acres of shelterwood combined with thinning)

<sup>3</sup> The recommended exceptions, under which 21" or greater diameter trees would be removed include:

- Removing large, fast growing true fir (e.g. white fir) in order to meet a maximum basal area objective that is otherwise fulfilled by large pine or other desirable species. The fir removal should be specific to a stand or grove where the choice is between removal or continued stress on more desirable large trees.
- Removing large true fir to favor growth of smaller pine in the understory.
- Removing large true fir to create openings for pine regeneration.
- Removing large true fir to give other species a chance to seed in and recolonize the site.
- Large trees of any species that are determined to be hazards to restoration or risk reduction activities, developed recreation sites (through the use of the R6 Hazard Tree Rating Guide), or public access roads.

TREATMENTS	ALTERNATIVE 2	ALTERNATIVES 3 AND 4	ALTERNATIVE 5
<b>Larch Restoration</b> - small group openings and thinning in stands where it objectives is to open up stands so existing larch component (which is declining in the project area) can be restored	0	0	735
<b>Underburning</b> - including mowing	7058 (includes approximately 5200 acres of mowing)	1009 (includes approximately 834 acres of mowing)	1009 (includes approximately 834 acres of mowing)
<b>Meadow Enhancement</b>	35	35	35
<b>Aspen Restoration</b>	10	10	10
<b>Dwarf Mistletoe Control</b> - Prune infected trees and thin stands	130	130	130
TOTAL ACRES TREATED	12,068	12,580	12,770
<b>Type of Post-Activity Fuel Treatment</b>	Alternative 2	Alternatives 3 and 4	Alternative 5
<b>Hand Piling</b>	2145	2408	2408
<b>Machine Piling</b> (affects up to 60% of the unit acres)	655 unit acres (up to 393 acres affected)	2266 unit acres (up to 1360 acres affected)	2973 unit acres (up to 1784 acres affected)
<b>Machine Piling on Skid Trails</b> (affects up to 20% of the unit acres)	604 unit acres (up to 121 acres affected)	3589 unit acres (up to 718 acres affected)	3145 unit acres (up to 629 acres affected)
<b>Underburning</b>	633	868	875
<b>Mowing + Underburning</b>	973	2440	2437
<b>Mowing in units where hand or machine piling is used</b> (these acres are included in the above hand and machine piling acres)	2451	5666	5692
Ground-based	1121	7332	7720
Helicopter	0	363	363

## Mitigation

Numerous mitigation measures were proposed to minimize, avoid or eliminate potentially significant impacts on the resources that would be affected by the alternatives, or rectifying the impact by restoring the affected environment. See the Draft Environmental Impact Statement, Chapter 2, for a detailed discussion of mitigation measures.

## Alternatives Considered but Eliminated from Detailed Study

Comments received in response to the Proposed Action provided suggestions for alternative methods for achieving the Purpose and Need. Several alternatives were considered, but dismissed from detailed consideration for reasons summarized below

### *Implement Only Defensible Space, or Fuel-Breaks*

Alternatives were considered that would only implement the Defensible Space strategy adjacent to evacuation route roads, residential areas and high public use or recreation developments; or a combination of defensible space and fuel-breaks. However, the interdisciplinary team did not feel that these Alternatives would adequately address the high risk of catastrophic fire to local residents and visitors, or adequately address forest health concerns in the Metolius Basin.

### *Burn only, no Tree Harvest*

The Alternative of using prescribed burning as the only tool for reducing forest fuels was considered. This Alternative would address the concern by some people to minimize tree harvest on public lands. It was determined that many stands in the project area could be burned without extensive pre-treatments, and this is proposed under Alternative 2 (over 7,000 acres proposed for underburning). However, current fuel densities and arrangements on the remaining project area would make it very difficult to control a prescribed fire or to get desired results of a low intensity ground fire.

*Over the last century, trees have grown much faster than the amount removed from all of the fires, harvest and mortality combined. In the southwest (Arizona and New Mexico), net annual growth is enough to cover a football field 1 mile high with solid wood. Recent removals have only been about 10 percent of this.*

Dale Bosworth, Forest Service Chief, 2002.

### *No Commercial Products from Tree Removal*

In response to some concerns about using timber sales, or the sale of products from forest health and fuel reduction activities, an Alternative which would not permit the use of these tools was considered. Since commercial timber sales are authorized on National Forest System lands and can be an effective tool in meeting forest health and risk reduction goals, this Alternative was not considered in detail. However, to address public concerns, and so that the Forest Service could try additional tools for implementing the project, the Sisters Ranger District applied for and was selected as a pilot under the new Stewardship Pilot Authority. See Appendix B of the Draft Environmental Impact Statement for a discussion about the new tools available.

### *Analyze Long-term Recreation Management*

Including recreation management within this analysis was considered so that a holistic analysis to managing resources and uses in the project area could be addressed at one time. However, CEQ regulations require that the purpose and need for an environmental analysis stay narrow and focused. Since the recreation management issues were not directly related to forest health and wildfire risk reduction, the Forest Service decided not to include these issue with this analysis.

## Environmental Consequences

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### Major conclusions:

- Risk of high severity wildfire would be greatly reduced under all of the action Alternatives. However, risk of high severity wildfire would not be reduced across *every* acre under any of the Alternatives. Given the complex variety of habitats required for the range of late-successional species in the project area, some areas would be left in a dense, though less resilient condition.
- A full range of tree age and size classes would remain across the landscape under any Alternative. The greatest reduction in tree size removed would be less than 8 “ diameter, particularly in the defensible space zones. However, clumps and thickets and a variety in tree sizes and species would remain scattered across the landscape.
- Alternative 1, no action, leaves more than 90% of the project area at risk of moderate to high severity wildfire, and thus poses the greatest risk to people, property and resources (Figure 7). In addition, the absence of proposed watershed mitigation of reducing road miles, leaves the greatest risk of sediment loss from roads. The No Action Alternative would not be consistent with all of the objectives of the Aquatic Conservation Strategy, and would have the greatest negative effects on habitat for species associated with more open, fire-adapted late-successional conditions (such as Peck’s penstemon and white-headed woodpecker). In the absence of a catastrophic disturbance, Alternative 1 would continue to provide short-term habitat for species associated with dense interior forests.
- Of the Action Alternatives, Alternative 2 results in the least short-term negative impacts to watershed conditions and soils. Alternative 2 is predicted to result in the best habitat conditions for species associated with dense, multi-storied forests (i.e. spotted owl, Canada lynx, pacific fisher, harlequin duck). Though all of the action alternatives reduce the risk of *high* severity wildfire, Alternative 2 would still leave 83% of the project area at risk of mixed severity wildfire (Table 2). Alternative 2 is also the least effective in reducing the risk of catastrophic insect or disease. As such, people, property and resources would remain at a greater risk than under the other Action Alternatives. Reduction of road miles, focused within riparian areas, would help reduce potential sediment delivery into streams.
- Alternative 3 and 4 would leave 63%-57% of the project area at risk of mixed and high severity wildfire (Figure 7, and Table 2), but would balance risk reduction with

maintenance of areas of higher stand densities. Both of these Alternatives would have fewer potential soil and watershed effects than Alternative 5. Alternatives 3 and 4 are predicted to result in the best habitat conditions for species associated with more open forests (white-headed woodpecker, bald eagle, goshawk).

- Alternative 5 results in the greatest potential watershed effects, and greatest short-term impacts on habitat for late-successional species associated with dense interior forests. However, this Alternative is the most effective at reducing the risk of moderate and high severity wildfire, both within the defensible space corridors, and throughout the landscape. As such, this Alternative would reduce the risk of wildfire effects to people, property and resources the most. Approximately 46% of the project would still remain at risk (Table 2), but the stands at risk would be important habitat for late-successional species that require more dense forest conditions, and along riparian areas, where it is more desirable to have higher stand densities. This alternative is also the most effective at reducing stand densities and thus the risk of habitat loss from insects or disease. The reduction of approximately 60 miles of roads would help mitigate watershed effects from vegetation management actions.

## Summary of Effects

Table 2 on the following page displays a summary of the predicted environmental effects of the Alternatives.

**Table 2. Comparison of Key Characteristics and Effects by Alternative**

Element of Purpose and Need or Key Issues	Alternative 1 No Action	Alternative 2	Alternative 3	Alternative 4 Proposed Action	Alternative 5
<b>FIRE HAZARD (Purpose and Need)</b>					
<b>Burn Severity</b> - percent of acres that are predicted to burn at low, mixed and high severity <sup>4</sup>					
Low Severity (non-lethal)	3% (357 acres)	6% (880 acres)	33% (4842 acres)	48% (7,043 acres)	53% (7,777 acres)
Mixed severity (from 30%-80% mortality)	45% (6663 acres)	83% (12,189 acres)	59% (8,657 acres)	45% (6,603 acres)	41% (6,106 acres)
High Severity (stand replacement)	52% (7653 acres)	11% (1,614 acres)	8% (1,174 acres)	8% (1,174 acres)	6% (880 acres)
<b>Defensible Space</b> – includes thinning, mowing, burning, and pruning	Not fully implemented. Some small dead and down trees can be removed by homeowners w/in 300' of private lots	Implemented on 4,936 acres. Focus on ground fuels and small ladder fuels. Trees larger than 12" diameter are not removed so no reduction in crown density	Implemented on 4,936 acres. Potentially removes trees potentially up to 16, so ladder fuels treated, but limited effect on crown density	Implemented on 4,936 acres. Potentially removes trees potentially up to 21" diameter. Both ladder fuels and crown density reduced.	

<sup>4</sup> *Low fire severity* is generally not lethal to the forest stand. These are the most beneficial types of burns because they help clean out fuels on the ground without killing the trees. *Mixed fire severity* means it burns somewhere between low severity and very hot, and can kill from 30%-80% of the forest vegetation, depending on stand structure and conditions. *High fire severity* would generally kill most of the forest vegetation (considered as a “stand replacement” event).



Element of Purpose and Need or Key Issues	Alternative 1 No Action	Alternative 2	Alternative 3	Alternative 4 Proposed Action	Alternative 5
<b>TREE SIZE (Key Issue)</b>					
<b>Tree Size</b> Upper diameter of trees that could be removed, with the exception of removing hazard trees to address public safety. Larger trees may be <i>treated</i> (but not removed) for dwarf mistletoe by pruning, girdling, or topping	N/A	12" diameter – All tree species	– 16" diameter – ponderosa pine, Douglas-fir, larch – 21" diameter – white fir	– 21" diameter – ponderosa pine, Douglas-fir, larch – 25" diameter – white fir	Not restricted; however, removal of ponderosa pine, Douglas-fir, larch trees larger than 21" diameter would be an exception, and only occur under certain conditions (see footnote in Table 1 for conditions)
<b>LATE-SUCCESSIONAL FOREST VEGETATION MANAGEMENT (Purpose and Need, and Key Issue)</b>					
<b>Old Growth<sup>5</sup></b> - Possible Old Growth stands treated  - Old Growth stands which remain at high densities <sup>6</sup> (measured as exceeding upper management zone)  - Can trees > 21" diameter be removed?	0 acres treated  5338 acres (94%) at high density  - N/A	4412 acres treated  4837 acres (86%) at high density  - No	4546 acres treated  4207 acres (75%) at high density  - No	4546 acres treated  3263 acres (58%) at high density  - Yes, white fir only	4625 acres treated  3153 acres (56%) at high density  - Yes, primarily white fir

<sup>5</sup> There are approximately 5565 acres of possible old growth stands

<sup>6</sup> Relates to risk of impacts from wildfire, insects and disease

Element of Purpose and Need or Key Issues	Alternative 1 No Action	Alternative 2	Alternative 3	Alternative 4 Proposed Action	Alternative 5
<b>Stand Density</b> - % of all project acres with densities over the upper management zone (UMZ). This relates to the % of area considered to be at <b>greater risk</b> of severe insect or disease effects  - % of NF lands Treated	82% of stands (12032 acres) exceed UMZ	62% of stands (9106 acres) exceed UMZ	42% of stands (6169 acres) exceed UMZ	36% of stands (5287 acres) exceed UMZ	34% of stands (4994 acres) exceed UMZ
	N/A	83% treated	86% treated	86% treated	88% treated
<b>Spotted Owl <i>nesting, roosting, and foraging</i> habitat</b> - acres in which proposed treatment may <i>degrade</i> habitat quality in the short-term	N/A	Approximately 17% (about 165 acres) of existing nesting, roosting, and foraging habitat may be degraded by thinning trees 12" diameter or less, primarily within defensible space			
<b>Spotted Owl <i>dispersal</i> habitat<sup>7</sup></b> - acres in which proposed treatment may <i>degrade</i> habitat quality in the short-term	N/A	Less than 1% of dispersal habitat may be degraded	Approximately 53% (about 4812 acres) of habitat suitable for dispersal may be degraded by reducing canopy and midstory density	Approximately 62% (about 5687 acres) of habitat suitable for dispersal may be degraded by reducing canopy and midstory density	

<sup>7</sup> The amount of dispersal habitat for northern spotted owl was determined by the acres of forests that have canopy cover greater than 30%. However, these acres may not all be well connected, and did not consider the quality or functionality of the dispersal acres. Also, many of the acres that qualified as dispersal are across ponderosa pine plant associations, which do not generally provide long-term dispersal habitat.

Element of Purpose and Need or Key Issues	Alternative 1 No Action	Alternative 2	Alternative 3	Alternative 4 Proposed Action	Alternative 5
<b>White-headed woodpecker</b> – acres of habitat in which proposed treatment may <i>enhance</i> habitat	N/A	8878 acres habitat enhanced (removes some midstory, though not as effectively as the other Action Alternatives. Maintains thickets for foraging)	9004 acres habitat enhanced (more effective than Alternative 2 at removing midstory canopy, while still maintaining thickets for foraging)		8384 acres habitat enhanced (however, removes more thickets, which can be important for foraging, than the other Action Alternatives)
<b>Goshawk</b> – acres of habitat treated	N/A	875 acres treated (short-term potential negative effect by removing some habitat elements, but long-term beneficial effect by improving the health of the stands, and accelerating development of large tree structure)	887 acres treated (short-term potential negative effect by removing some habitat elements, but long-term beneficial effect by improving the health of the stands, and accelerating development of large tree structure)		
<b>Peck’s Penstemon</b> - acres of beneficial treatments from meadow & aspen restoration - acres on which individual plants may be damaged due to trampling from harvest activities	N/A	1087 acres beneficial treatments from meadow restoration and underburning  84 acres with potential risk of impacts to individual plants, though predicted long-term benefits to habitat by opening up stands	52 acres beneficial treatments from meadow restoration and underburning  289 acres with potential risk of impacts to individual plants, though predicted long-term benefits to habitat by opening up stands	52 acres beneficial treatments from meadow restoration and underburning  279 acres with potential risk of impacts to individual plants, though predicted long-term benefits to habitat by opening up stands	

Element of Purpose and Need or Key Issues	Alternative 1 No Action	Alternative 2	Alternative 3	Alternative 4 Proposed Action	Alternative 5
Meadow Enhancement and Aspen Restoration	None	<ul style="list-style-type: none"><li>– Thin conifers in meadows potentially up to 12” diameter (about 35 acres)</li><li>– Burn meadows if soils and vegetation can benefit</li><li>– Thin aspen as needed to stimulate groves (about 10 acres)</li></ul>			
WATER QUALITY (Purpose and Need, Key Issue)					
Riparian Reserve <sup>8</sup> - Acres of riparian reserve stands treated	N/A	1188acres	1190 acres		
Riparian Reserve – Type of treatments proposed  – Within defensible space	N/A	<ul style="list-style-type: none"><li>– Thin 12” or less, primarily by hand.</li><li>- Burn where suitable</li><li>– Thin 8” or less, by hand</li></ul>	<ul style="list-style-type: none"><li>– Thin, potentially up to 16” diameter. Mitigate impacts by logging over frozen ground, when possible. Pull material to skid roads.</li><li>- Burn where suitable</li><li>– Thin 8” or less, by hand</li></ul>	<ul style="list-style-type: none"><li>– Thin 12” or less in Jack, First and Lake Creek (since they will be used as owl dispersal corridors). Actions in other riparian reserves, follow Alternative 4</li><li>– Thin 8” or less, by hand</li></ul>	
Riparian Acres treated by hand (no machinery)	N/A	1175 acres	906 acres		
Riparian Acres treated by low impact machinery	N/A	13 acres	284 acres		

<sup>8</sup> Actions indicated would only occur within stands where needed to meet forest health and risk reduction objectives

Element of Purpose and Need or Key Issues	Alternative 1 No Action	Alternative 2	Alternative 3	Alternative 4 Proposed Action	Alternative 5
SOIL HEALTH (Purpose and Need, and Key issue)					
Detrimental Soil impacts from proposed actions	N/A	Least potential impacts. Will meet LRMP standards after mitigation	Greater potential impacts than under Alternative 2, but less than Alternative 5. Will meet LRMP standards after mitigation		Greatest potential impacts. Will meet LRMP standards after mitigation
ROADS (Proposed Action and Key Issue)					
Roads	<ul style="list-style-type: none"><li>- Continue to re-close breached roads.</li><li>- No new roads developed</li></ul>	<ul style="list-style-type: none"><li>- Focus road closures in riparian areas and in First and Suttle sub-watersheds.</li><li>- Close (inactivate and decommission) total of 20 road miles</li><li>- No new roads developed.</li><li>- 0.25 miles of temporary roads for removing trees proposed (will be decommissioned after trees removed)</li></ul>	<ul style="list-style-type: none"><li>- Focus road closures in riparian areas and in First and Suttle sub-watersheds <i>and</i> in deer winter range.</li><li>- Close (inactivate and decommission) total of 50 road miles</li><li>- No new roads developed.</li><li>- 1.65 miles of temporary roads for removing trees proposed (will be decommissioned after trees removed)</li></ul>	<ul style="list-style-type: none"><li>- Focus road closures in riparian areas and in First and Suttle sub-watersheds <i>and</i> in deer winter range, <i>and</i> across other sensitive resource areas.</li><li>- Close (inactivate and decommission) total of 60 road miles</li><li>- No new roads developed.</li><li>- 1.8 miles of temporary roads for removing trees proposed (will be decommissioned after trees removed)</li></ul>	

Element of Purpose and Need or Key Issues	Alternative 1 No Action	Alternative 2	Alternative 3	Alternative 4 Proposed Action	Alternative 5
MISCELLANEOUS					
Scenic View enhancements	None	Scenery quality enhanced under each of the action Alternatives. Viewers would be able to see further into the ponderosa pine stands under Alternatives 3, 4, and 5 than under Alternative 2. Short-term (1-3 years) visual quality impacts associated with harvest activities and burning would be greatest under Alternative 5 and the least under Alternative 2. Site-specific, short-term amendment of forest plan visual quality standards and guidelines recommended.			
Urban Interface (treatments around private property and summer home lots)	N/A	– Implement defensible space treatments (maintain screening where possible – coordinate with lot owners)			
Economics					
Estimated Volume - saw logs	N/A	0	21,702 MBF	28,944 MBF	40,732 MBF
- pulp/chip		0	11,210 tons	11,370 tons	11,370 tons
Cost of logging trees greater than 12” diameter, including transportation to the mill		\$0	\$6,658,000	\$8,452,000	\$11,821,000
Cost of thinning small trees, prescribed burning and mowing		\$2,901,000	\$1,697,000	\$1,696,500	\$1,711,000
Cost of cleaning up fuels from logging and other vegetation treatments		\$1,721,000	\$2,992,000	\$2,992,000	\$3,034,000
Total Costs		\$4,622,000	\$11,347,000	\$13,140,500	\$16,566,000
Total Product Values		\$395,800	\$6,248,300	\$8,967,400	\$13,114,800
Net Value		- (\$4,224,2000)	- (\$5,098700)	- (\$4,173,100)	- (\$3,451,200)
Road Work Estimated costs of closures (both inactivation and decommissioning)	N/A	\$49,710	\$114,330		\$132,030

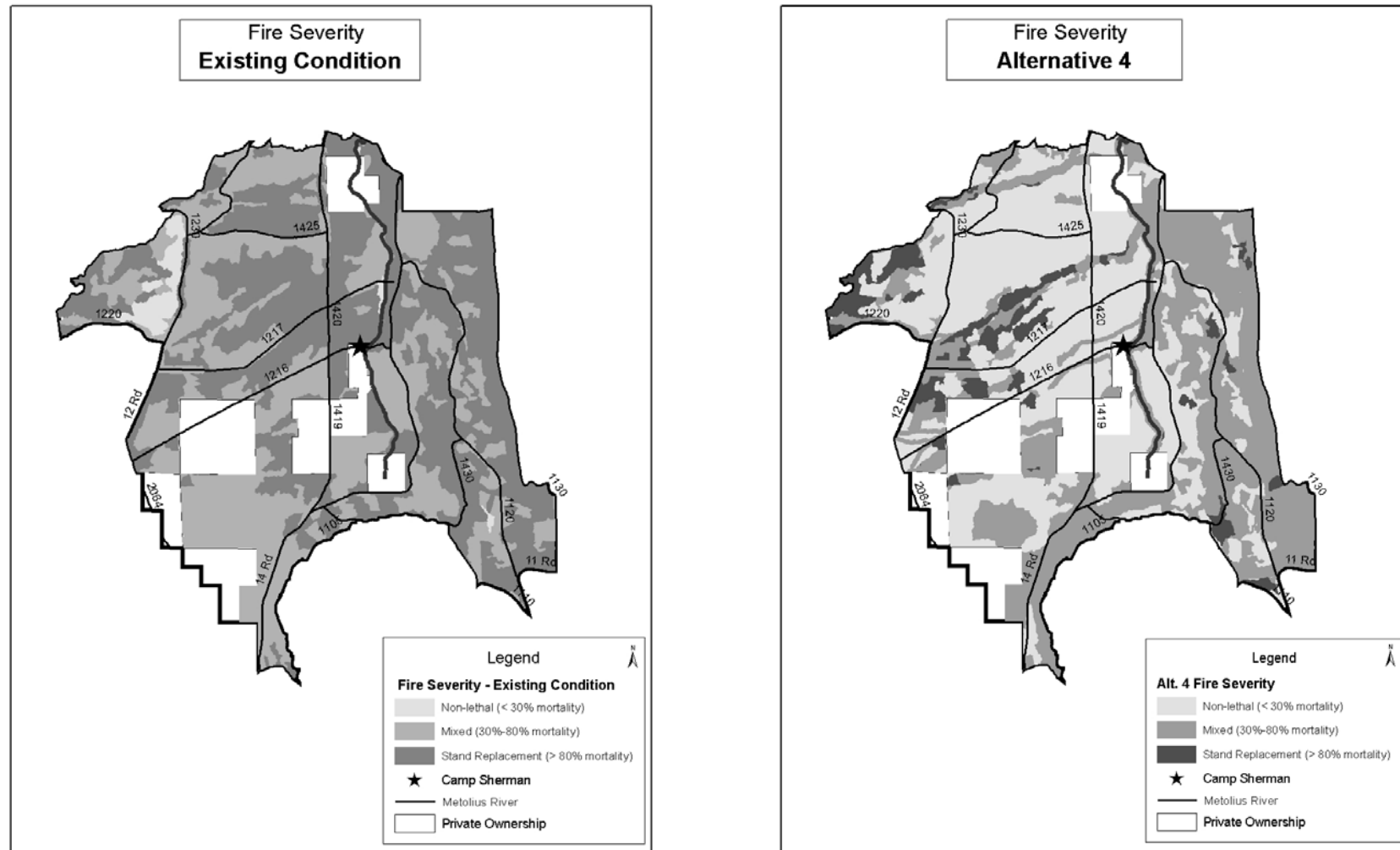


Figure 7. Comparison of Predicted Wildfire Severity between Alternative 1 and Alternative 4

## Forest Plan Amendments

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### Visual Quality

A short-term, non-significant, site specific amendment of several visual quality standards and guidelines in the Deschutes National Forest Land and Resource Management Plan, is proposed to allow impacts from tree removal and prescribed burning to be visible to the “casual observer” for slightly longer periods, and openings (due to the removal of dead and declining trees under Alternative 5) to occur on slightly more acres than under the existing Standards and Guidelines. Though the current Visual Quality Standards and Guidelines would not be met in the short-term, the proposed actions are expected to better meet visual quality objectives for the long-term (over five to ten years). Short-term visual impacts are expected from removing vegetation (slash, stumps, stacked logs, skid roads), reducing fuels (blackened, scorched vegetation and tree trunks), and creating openings (under Alternative 5 only). Amendments are proposed for the standards and guidelines for Scenic Views (MA9), Metolius Heritage (M19), Metolius Black Butte (M21), and Metolius Special Forest (M22).

### Fuelwood Collection

A site-specific, non-significant amendment of fuelwood standard and guideline, M19-27, in the Deschutes National Forest Land and Resource Management Plan is proposed to allow the Forest Service to permit commercial and personal use fuelwood collection in the Metolius Heritage area.

It is assumed that this standard and guideline was initially developed to prevent impacts that could be associated with collection of fuelwood, such as user-created roads, piles of limbs and slash from wood cutting, and visible cut stumps. However, fuelwood may be a product that could be utilized as an outcome of implementing forest health and fuel reduction objectives under this project. Both commercial and personal fuelwood collectors could help accomplish these objectives by removing excess vegetation. The activity would only be permitted in specified areas and under specified terms and conditions that would mitigate potential impacts.

### *Effects of Proposed Forest Plan Amendments*

The proposed revised Visual Quality and Fuelwood standards and guidelines would not significantly change the forest-wide impacts disclosed in the Deschutes National Forest Land and Resource Management Plan Environmental Impact Statement.